Preliminary Screening Report Form

Preliminary screener: MVLWB **Reference / File number:** MV2018X0017 **TITLE:** Miscellaneous – Groundwater Monitoring **ORGANIZATION:** University of Guelph – G360 Institute for Groundwater Research **MEETING DATE:** December 10, 2018 February 27, 2020	**EIRB** **Reference number:**

Type of Development: (CHECK ALL THAT APPLY)	☐	New
	☒	Amend, EIRB Ref. #
	☒	Requires permit, licence, or authorization
	☐	Does not require permit, licence, or authorization

Project Summary:

On July 30, 2018, University of Guelph – G360 Institute for Groundwater Research (G360 Institute), a research institute located at the University of Guelph, submitted an application for a new Type A Land Use Permit for a groundwater monitoring program in the Fort Liard area. The goal of this project is to improve understanding of groundwater in the transboundary area of the NT portion of the Liard Basin. It is anticipated that this project could assist Indigenous and community governments, industry, regulators, decision makers, and the public to make environmentally sustainable decisions about future industrial development and groundwater use in the Fort Liard area.

The proposed activities include use of a truck-mounted drill rig to drill a maximum of 9 boreholes at up to three separate locations in the Fort Liard area for long-term groundwater monitoring of the freshwater zone. The boreholes will be 4-inches in diameter and extend to depths between 100 and 149 metres. Down-hole geophysical logging (using geophysical equipment including logging probes, winch, and tripods), along with coring and rock sampling will occur in each borehole to collect vertical profile data. Boreholes will have pressure and temperature transducers installed; some will be grouted in place to be kept in permanently for long-term monitoring, while others will be installed temporarily using a removable flexible liner. Depth-discrete multi-level groundwater sampling systems will be installed in one or two of the boreholes at each location for groundwater samples to be taken at specific depth intervals to characterize water quality. Pumping tests will be conducted at boreholes and each location may have temporary shallow instrumentation installed to measure soil gas and near-surface methane emissions.

The period of operation is approximately 2 weeks a season, commencing in the spring of 2019. Each year's work is reliant on available funding and resources. Most likely, the summer or fall months is when the bulk of the work will occur, although drilling could occur in the winter.

Waste generated as a result of this project are expected to be non-hazardous. During the drill process rock cuttings and drill water waste will be generated. Drill cuttings and rock waste that are not transported offsite for analysis will be disposed of in a low-lying gully or depression at least 100 m away from any water source. Freshwater may be used as a lubricant for drilling, with water usage being less than 44 m^3 per day. Returns of excess drilling fluid will be tested for total dissolved solids (TDS) to ensure the returning fluid is not in excess of 2500 mg/L. If the fluid does exceed this, it will be stored in intermediate bulk container tanks and transported off-site for disposal at an approved facility in British Columbia. Once drilling is complete, an above-ground well will remain at each borehole location. If the wells are no longer needed, the casing will be removed and site re-contoured as necessary. Minor clearing or brush cutting may be required to access specific well installation locations, but sites will be selected to minimize the need for brush clearance. Cleared Brush will be removed for disposal, or if quantities are small will be placed in a local wooded area. Efforts will be taken to minimize the disturbance to flora and fauna.

No camp is proposed as accommodations in Fort Liard will be used. Activities will use existing roads.

Diesel refueling will be done via a 100-gallon pickup mounted tank using an electric pump and hoses. Gasoline refueling will be done via 5-gallon Jerry cans transferred to the Honda generator using funnels. All fuel transfer will be conducted on spill contaminant mats. Spill kits will be placed in each vehicle transporting fuel. No on-site fuel storage has been proposed.

On January 10, 2020, G360 Institute submitted a Land Use Permit Amendment Application to add a drill site to the project area and change the type and size of equipment to include a LS600 Drill rig equipped with rotosonic, air rotary, and wireline coring capabilities. The new technique does not involve significantly heavier equipment, or the addition of drilling fluids, compared to the drilling proposed in the original Application for MV2018X0017.

Scope:

a) Drilling Boreholes for long-term groundwater monitoring;
b) Use of drill equipment and vehicles; and
c) Brush clearing and disposal.

Land Use Eligibility - Section 18 Mackenzie Valley Land Use Regulations:
18(b)

Type of Disposition	**Disposition Number(s)**
☐ Mineral Claims	
☐ Prospecting Permit (s)	
☐ Mineral Leases	
☐ Oil and Gas: EL/SDL/PL	
☐ Quarry Permit	
☐ Timber Permit	
☒ Other:	Reserve 095B03019 Reserve 095B03017 Reserve 095B06006 Reserve 095B03034

Principal Activities (*related to scoping)* (CHECK ALL THAT APPLY)

- ☐ Construction
- ☒ Installation
- ☐ Maintenance
- ☐ Expansion
- ☐ Operation
- ☐ Repair
- ☒ Research
- ☐ Water Intake
- ☐ Other:
- ☐ Exploration
- ☐ Industrial
- ☐ Recreation
- ☐ Municipal
- ☐ Quarry
- ☐ Linear / Corridor
- ☐ Sewage
- ☐ Decommissioning
- ☐ Abandonment
- ☐ Aerial
- ☐ Harvesting
- ☐ Camp
- ☒ Scientific/
- ☐ Solid Waste

Principal Development Components (*related to scoping*) (CHECK ALL THAT APPLY)

- ☐ Access Road
  - ☐ construction
  - ☐ abandonment/removal
  - ☐ modification e.g., widening, straightening
- ☐ Automobile, Aircraft or Vessel Movement
- ☐ Blasting
- ☐ Building
- ☐ Burning
- ☐ Burying
- ☐ Channelling
- ☐ Cut and Fill
- ☒ Cutting of Trees or Removal of Vegetation
- ☐ Dams and Impoundments
  - ☐ construction
  - ☐ abandonment/removal
  - ☐ modification
- ☐ Ditch Construction
- ☐ Drainage Alteration
- ☐ Drilling other than Geoscientific
- ☐ Ecological Surveys
- ☐ Excavation
- ☐ Explosive Storage
- ☐ Fuel Storage
- ☒ Topsoil, Overburden or Soil
  - ☐ fill
  - ☒ disposal
  - ☒ removal
- ☒ Waste Management
  - ☐ disposal of hazardous waste
  - ☒ waste generation
  - ☐ sewage
  - ☐ disposal of sewage
- ☐ Geoscientific Sampling
- ☐ Trenching
- ☐ Diamond drill
- ☐ Borehole core sampling
- ☐ Bulk soil sampling
  - ☐ gravel
  - ☐ hydrological Testing
- ☒ Site Restoration
  - ☐ fertilization
  - ☐ grubbing
  - ☐ planting/seeding
  - ☐ reforestation
  - ☐ scarify
  - ☐ spraying
  - ☒ re-contouring
- ☐ Slashing and removal of vegetation
- ☐ Soil Testing
- ☐ Stream Crossing/Bridging
- ☐ Tunnelling/Underground
- ☐ Other:

☐ storage

NTS topographic map sheet numbers:
095B

Latitude / longitude and UTM system:
NAD 1983 UTM Zone 10V

NE corner: 60.34923 °N, 122.98179 °W
SW corner: 60.05304 °N, 123.43772 °W

Nearest community and water body:
Fort Liard, Liard River

Land Status (*consultation information*)
☐ Free Hold/Private ☒ Commissioner's/Territorial Lands ☐ Federal Crown Land ☐ Municipal Land

Transboundary/Transregional Implications
☐ British Columbia ☐ Alberta ☐ Saskatchewan ☐ Yukon
☐ Nunavut ☐ National Park ☐ Inuvialuit Settlement Region
☐ Wek'èezhìi ☐ Gwich'in ☐ Sahtu

Type of transboundary implication: ☐ Impact / Effect ☐ Development

☐ Public concern: _____
(Describe.)

Physical - Chemical Effects

Impact	***Mitigation***
1) Ground Water	
☒ water table alteration	Should a flowing artesian well be encountered during drilling, there is a standard land use permit condition that could be included in the Land Use Permit to mitigate this issue.
☒ water quality changes	Excess Borehole drilling wastewater (freshwater used as a lubricant for drilling) may be contaminated. Excess drilling fluid will be tested for total dissolved solids (TDS). If TDS > 2500 mg/L the drilling fluids will be collected in tanks and removed off-site for disposal.
☒ infiltration changes	Drilling Boreholes may allow ground or surface water to flow into the holes. Flexible (FLUTe ®) liners will be used as temporary seals until permanent groundwater monitoring infrastructure is installed to prevent water from entering the holes.
☐ other:	
☐ N/A	

Impact	***Mitigation***
2) Surface Water	
☐ flow or level changes	
☒ water quality changes	The possible drilling site located north of Fort Liard on Highway is approximately 1.3 km from a small lake and 1 km from Liard River. Land use permit conditions that could be included in the Land Use Permit are included to mitigate possible water quality changes to these water bodies. Fuel storage, drilling near water, and non-toxic drilling waste disposal must be at least 100 m from the Ordinary High Water Mark for any Watercourse.
☐ water quantity changes	

☐ drainage pattern changes

☐ temperature

☐ wetland changes/loss

☐ other:

☐ N/A

Impact	*Mitigation*
3) Noise	
☐ noise in/near water	
☒ noise increase	Drilling activities will occur approximately 2 weeks a year, thus noise increase is short-term and temporary. No mitigations proposed.
☐ other:	
☐ N/A	

Impact	*Mitigation*
4) Land	
☐ geologic structure changes	
☒ soil contamination	Freshwater used as a lubricant for drilling could be contaminated. If total dissolved fluids (TDS) >2500 mg/L the drilling fluid will be collected in tanks and removed off-site for disposal at an appropriate wastewater facility so as not to contaminate soil.
☐ buffer zone loss	
☐ soil compaction and settling	
☐ destabilization/erosion	
☐ permafrost regime alteration	
☐ explosives/scarring	
☐ other:	
☐ N/A	

Impact	*Mitigation*
5) Non-renewable natural resources	
☐ resource depletion	
☐ other:	
☒ N/A	

Impact	*Mitigation*
6) Air/climate/atmosphere	
☐ other:	
☒ N/A	

BIOLOGICAL ENVIRONMENT

Impact	*Mitigation*
1) Vegetation	
☒ species composition	Minor clearing or brush cutting may be necessary for access to drilling locations, however current potential drill locations are in areas where minimal brush clearance is required, very near to road ways. If the groundwater wells are no longer needed for monitoring purposes, the casing stick-up will be removed and the site re-contoured as necessary. No mitigation is proposed.
☒ species introduction	The invasive species Scentless Chamomile (*Matricaria perforate*) is found at one of the potential drilling sites (located approximately 15 km south of Fort Liard along Highway 7). In order to prevent the spread of this invasive species, equipment will be decontaminated between sites, and decontamination fluid will be collected and disposed of appropriately.
☐ toxin/heavy accumulation	
☐ other: Linear Migration routes, habitat fragmentation	
☐ N/A	

Impact	*Mitigation*
2) Wildlife and Fish	
☐ effects on rare, threatened or endangered species	
☐ fish population changes	
☐ waterfowl population changes	
☐ breeding disturbance	
☐ population reduction	
☐ species diversity change	
☐ health changes	
☒ behavioural changes	Wildlife in the area could be attracted to food and food waste. All domestic waste will be collected in portable tamper-resistant containers and emptied and cleaned at the end of each day.
☒ habitat changes / effects	It is possible that bear dens, beaver lodges, muskrat push-ups, and hibernacula could be near potential drilling sites. If work occurs between September 30 and March 30, pre-activity surveys will be conducted to identify active bear dens in the area. If an active Bear den is identified, an 800 m exclusion zone will be maintained around the bear den. No beaver lodges, muskrat push-ups and hibernacula will be disturbed, if encountered. A standard condition could be included in the Land Use Permit to ensure the Permittee will take all reasonable measures to prevent damage to wildlife and fish Habitat during this land-use operation.
☐ game species effects	
☐ toxins/ heavy metals	
☐ forestry changes	
☐ agricultural changes	

☐ other:

☐ N/A

Interacting Environment

Impact	*Mitigation*
1) Habitat and Communities	
☐ predator-prey	
☒ wildlife habitat/ecosystem composition changes	It is possible that bear dens, beaver lodges, muskrat push-ups, and hibernacula could be near potential drilling sites. If work occurs between September 30 and March 30, pre-activity surveys will be conducted to identify active bear dens in the area. If an active Bear den is identified, an 800 m exclusion zone will be maintained around the bear den. No beaver lodges, muskrat push-ups and hibernacula will be disturbed, if encountered. Local Wildlife Monitors will be hired for the duration of drilling activities to locate wildlife dens, lodges, etc. and wildlife activity, and the Wildlife Monitors will inform G360 Institute if drilling sites should be reconsidered based on the wildlife monitoring results.
☐ reduction/removal of keystone or endangered species	
☐ removal of wildlife corridor or buffer zone	
☐ other:	
☐ N/A	

Impact	*Mitigation*
2) Social and Economic	
☐ planning/zoning changes or conflicts	
☐ increase in urban facilities or services use	
☐ rental house	
☐ airport operations/capacity changes	
☐ human health hazard	
☐ impair the recreational use of water or aesthetic quality	
☐ affect water use for other purposes	
☒ affect other land use operations	Obstruction of activities (road maintenance, NorthwesTel tower access) during drilling operations at Reserve 095B03034 will be mitigated by advising the Department of Infrastructure and NorthwesTel of drilling activities as soon as they are known. If drilling in the right-of-way, the operations will occur as far as possible off the road, near the tree line outside the ditch. If drilling at the NorthwesTel tower site, precautions will be made to insure a safe access to the tower at any time. Obstruction of maintenance activities (e.g. snow removal) by the equipment that will be left on site after drilling operations will be mitigated by placing four cement pillars around the instrumentation box so it is clearly identifiable, and a marker for snow removal (6 foot long stick) will be put in place.

☐ quality of life changes

☐ public concern

☒ other: damage to property

Damage to the fibric optic cable at Reserve 095B03034 will be mitigated by private underground locates that will occur prior to all drilling that will identify location of all underground infrastructures. Additionally, the first 50 cm of a borehole will be dug by hand to validate the absence of an optic cable.

Damages to the NorthwesTel tower access road due to heavy equipment will be mitigated as drilling activities will occur in March when thawing ground and rain should not be an issue. If there is a need to bring heavy equipment on the access road at another time of year, precautions will be taken to avoid the usage of the road after a rain event.

☐ **N**/A

Impact ***Mitigation***

3) Cultural and Heritage

☐ effects to historic property

☐ increased economic pressure on historic properties

☐ change to or loss of historic resources

☐ change to or loss of archaeological resources

☐ increased pressure on archaeological sites

☐ change to or loss of aesthetically important sites

☒ effects to aboriginal lifestyle

Negative impacts to the health of the watershed could negatively impact Acho Dene Koe First Nation's community members' ability to practice subsistence harvesting. As a mitigation, drilling will not occur within 100 m from the ordinary high-water mark of any Watercourse. Also, G360 Institute will provide the opportunity to interested community members observe activities at the drilling sites to answer questions and provide an opportunity for community members to share knowledge of the area.

Local Wildlife Monitors will make G360 Institute aware of wildlife activity in the vicinity of the drill site to mitigate impacts to culturally significant caribou in the area.

☐ other:

☒ N/A

- Pursuant to Schedule 4.1 of the **Northwest Territory Métis Nation** (NWTMN) Interim Measures Agreement, the MVLWB determined that written notice was given to the NWTMN and that a reasonable period of time was allowed for NWTMN to make representations with respect to the application.

- Pursuant to section 27, paragraphs (a) and (b) of the **Dehcho First Nations** (DCFN) Interim Measures Agreement, the MVLWB has determined that written notice was given to the DCFN, and that a reasonable period of time was allowed for DCFN to make representations with respect to the application.

Acho Dene Koe First Nation	GNWT – MACA (Municipal and Community Affairs)
Canadian Northern Economic Development Agency – NWT Region	GNWT – PPCA (Policy, Planning, Communications and Analysis (w/in ITI))
Deh Cho Land Use Planning Committee	GNWT – PWNHC (Prince of Wales Northern Heritage Centre (w/in ECE))
Deh Gah Got'ie Dene Council	Hamlet of Fort Liard
Dehcho First Nations	Hamlet of Fort Providence
Dene Nation	INAC - CARD
Dene Tha' First Nation	INAC - NWT Inspectors
Deninu K'ue First Nation	INAC – Yellowknife
Digaa Enterprises Ltd.	Ka'a'gee Tu First Nation
Environment and Climate Change Canada	Katlodeeche First Nation
Fisheries and Oceans Canada	Liard First Nation (Yukon)
Fort Providence Metis Council #57	Liidlii Kue First Nation (Ft Simpson)
Fort Providence Resource Management Board	Mackenzie Valley Environmental Impact Review Board
Fort Simpson Metis Local 52	MVLWB
Forward Mining	Naha Dehe Dene Band
GLWB	North Slave Metis Alliance
GNWT – ENR	Northwest Territory Metis Nation
GNWT – ENR – Deh Cho Region	NWT- OROGO
GNWT – ENR – EAM (Environmental Assessment and Monitoring)	Pehdzeh Ki First Nation (Wrigley)
GNWT – ENR - South Slave Region – Fort Smith	Ross River Dena Council
GNWT – Executive and Indigenous Affairs	Sambaa Ke First Nation (Trout Lake)
GNWT – HSS (Health and Social Services)	Snap Lake Environmental Monitoring Agency - SLEMA
GNWT – INF (Infrastructure)	Tlicho Government
GNWT – ITI (Industry, Tourism and Investment)	Town of Hay River
GNWT – Lands	Tthets'ek'ehdeli First Nation (JMR)
GNWT – Lands – Dehcho Region	Wek' eezhii Renewable Resources Board
GNWT – Lands – Hay River	West Point First Nation
GNWT – Lands – North Slave Region	WLWB
GNWT – Lands – South Slave Region – Fort Smith	Wood

Reasons For Decision
(List all reasons and supporting rationales for preliminary screening decision)

DECISION

The Mackenzie Valley Land and Water Board (the Board) is satisfied that the preliminary screening of University of Guelph – G360 Institute for Groundwater Research's January 17, 2020 Amendment Application for MV2018X0017 for Groundwater monitoring in the Fort Liard area has been completed in accordance with section 125 of the *Mackenzie Valley Resource Management Act* (MVRMA).

The Board is satisfied that communities and First Nations affected by the Amendment Application have been notified and provided adequate time to provide comment on the Amendment Application as required by land claim and self government agreements, the MVRMA, policy directions relating to Interim Measures Agreements, and any other applicable legislation and agreements.

Having reviewed all relevant evidence on the Public Registry, including the submissions of the Applicant, the written comments received by the Board and any Staff Reports prepared for the Board, the Board has decided that in its opinion:

- The proposed development will not have a significant adverse impact on the environment; and
- The proposed development is not a cause of public concern.

The Board is also of the opinion that the Amendment Application can proceed through the regulatory process and that any impacts of the development on the environment can be mitigated through the imposition of the terms and conditions in the attached Land Use Permit.

As a result, the Board, having due regard to the facts and circumstances, the merits of the submissions made to it, and to the purpose, scope, and intent of the MVRMA and the Mackenzie Valley Land Use Regulations has decided that this Amendment Application for the Land Use Permit be issued subject to the terms and conditions contained therein.

	Preliminary Screening Decision
☒	**Outside Local Government Boundaries**
☐	The development proposal might have a significant adverse impact on the environment, *refer it to the EIRB*.
☒	*Proceed with regulatory process and/or implementation.*
☐	The development proposal might have public concern, *refer it to the EIRB*.
☒	*Proceed with regulatory process and/or implementation.*
☐	**Wholly Within Local Government Boundaries**
☐	The development proposal is likely to have a significant adverse impact on air, water or renewable resources, *refer it to the EIRB*.
☐	*Proceed with regulatory process and/or implementation*.
☐	The development proposal might have public concern, *refer it to the EIRB*.
☐	*Proceed with regulatory process and/or implementation*.

Preliminary Screening Organization

Mackenzie Valley Land and Water Board

February 27, 2020

Signatures

Mavis Cli-Michaud, Chair